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Third Report on the Explorations at Dog Holes, Warton Crag, Lancs.

BY

J. WILFRID JACKSON, F.G.S.

(Assistant Keeper of the Manchester Museum).

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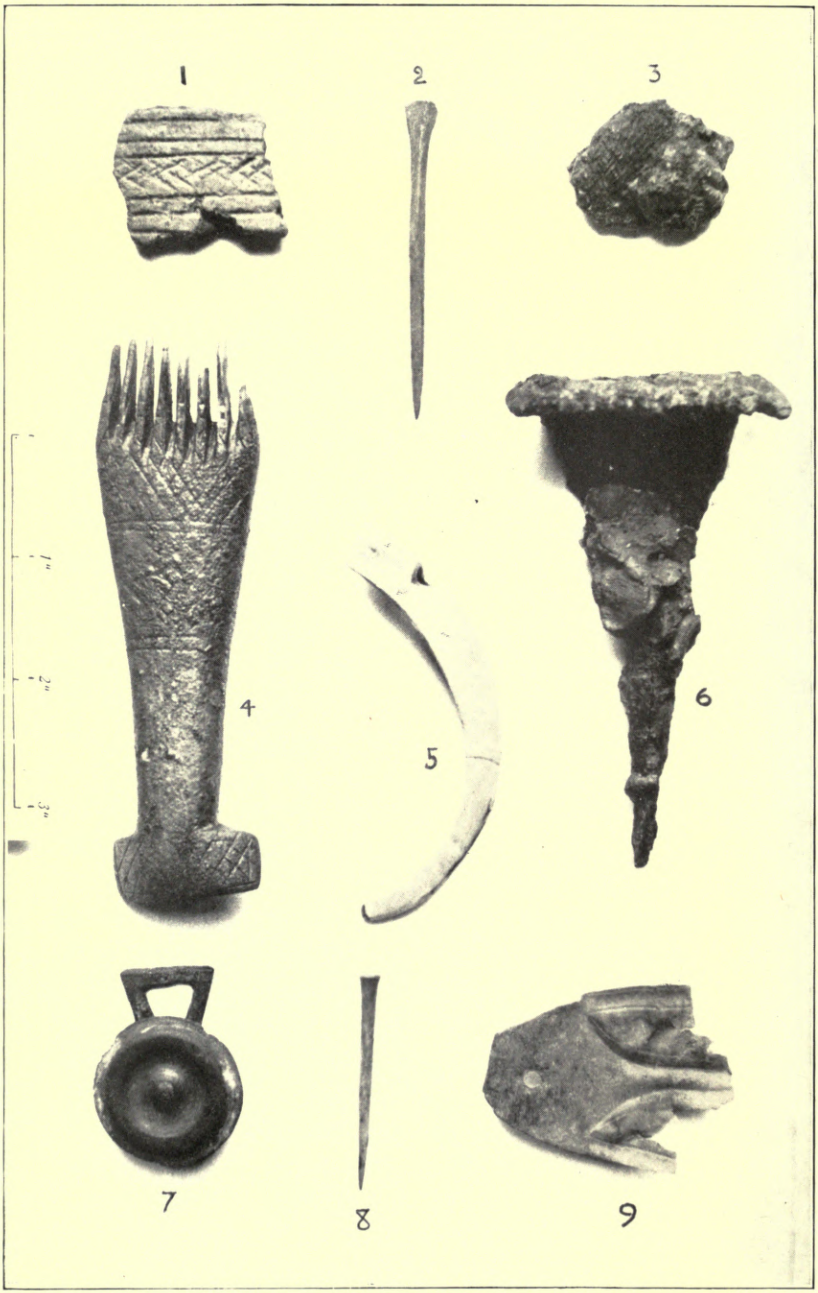

OBJECTS FROM DOG HOLES, WARTON CRAG, LANCS.

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BY J. WILFRID JACKSON, F.G.S.
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I.—Introduction.

THIS communication deals with further extensive investigations made at this celebrated Warton cave during May and June last year (1912), the diggings being conducted under the joint auspices of this Society and the Cumberland and Westmorland Antiquarian and Archæological Society. Financial assistance was also rendered by several private individuals, including Professor T. Mc.Kenny Hughes, of Cambridge, Mr. B. R. Lucas, F.G.S., and Mr. T. H. Platt, and to the above societies and friends I wish here to record my sincere thanks for their kind interest and generosity. I have also again to thank Mr. E. B. Dawson for allowing me to continue investigations on his property and for the use of most of the tackle. The same workmen were employed as in my previous diggings, and this fortunate circumstance was a decided consideration.

Though inclement weather prevented continuous work on one or two days, and the removal of the large limestone blocks rendered the work somewhat arduous, the investigations on the whole were decidedly successful and

of extreme interest. Diggings were first commenced at the Swirl Hole end of the slope from the Shaft-foot, with the object of providing a place for the large limestone block immediately below the entrance to be rolled into. This work was successfully carried out and the area below the boulder rendered available for examination.

In the course of digging out the material from the slope several bones and teeth were met with, mostly belonging to oxen, sheep, and dog; also fragments of red Late-Celtic pottery and part of an iron knife and iron "key." It was anticipated that in this area the weights belonging to the fine pair of bronze balances found here in 1910 would be discovered, but no traces of these were met with.

The material below and around the area occupied by the large boulder was next excavated, and here again fragments of Late-Celtic ware were found along with patches of charcoal and various bones and jaws of ox, &c. Other objects found on this site included cockle shells, three iron fragments (one of which retains the impression of some textile material), iron nails, a strip of lead, a bone awl, two bone pins, a fragment of ornamented bronze, and the penial bone of a wolf.

The charcoal was not in a definite layer, though it occupied the same position as the charcoal layer met with at this part of the cave during the 1909 excavations. The discovery, however, of the charcoal and other remains seems to suggest that the large limestone boulder fell from the roof at a later date than that of the occupation. Below this horizon, and well down into the Fissure immediately below, the material consisted chiefly of water-worn stones with very little clay, along with scanty remains of horse, ox, dog, and sheep; also fragments of a human skull.

The North Passage, near the foot of the Shaft, was then investigated, and here several interesting objects were brought to light, including more iron nails, an iron ring, fragments of Late-Celtic ware, and a bronze button or cloak fastener. Bones on the whole were scarce, but those found were of some interest, and consisted mainly of horse, ox, pig, sheep, and dog, together with fragments of human skulls and very robust human limb-bones. Some of the ox bones, as well as all the human limb-bones, are much darker in colour and different in state of preservation, and appear to be of greater age than the other bones, though only very little depth separated the two series.

At a later date excavations were made in the Bone Chamber at a point about two-thirds up the passage, where so many human remains were met with on previous occasions. These diggings, which were two feet or more below the original surface level of the cave, resulted in the discovery of many other human remains, bringing up the total of individuals represented in this part of the cave to quite a score.

As on previous occasions the skulls were mostly in a fragmentary condition, but one is fortunately in a sufficiently perfect condition for measurements to be made. Many of the limb-bones are also somewhat broken, or too badly decayed for accurate examination and comparison, but one or two are fairly complete. The most remarkable amongst the remains are the limb-bones of an exceedingly small, but quite adult, person; also one or two lower jaws presenting very interesting features, one being without the second premolar tooth on either side of the jaw, a similar case being met with here in 1909.

In the clayey material around the human remains was an interesting series of bones and teeth of domestic and

wild animals, including those of the dog, red-deer, roebuck, sheep, ox, urus, and pig, as well as numerous smaller creatures. Several large and small flint-flakes, a fragment of rude ornamental pottery, and a perforated tusk of a boar were also discovered in the immediate vicinity, and occasionally fragments of charcoal were noticed in the clay surrounding the various remains.

The greatest difficulty was experienced here in removing the numerous large stones embedded in the clayey matrix, and many of the human remains suffered in consequence, as it was impossible to remove them without some injury.

A very remarkable and interesting find was made in this chamber in the form of an early weaving-comb made from red-deer antler. It was found in a sort of pocket at one side of the cave, and quite unassociated with any other remains.

II.—Descriptions of the Remains found.

(*a*) miscellanea.

Pottery.—As previously mentioned fragments of Late-Celtic ware were met with in one or two places near the Shaft, but these call for no special remark, as they belong to types previously found in this area of the cave (see "Preliminary Report," 1910).*

Rude Hand-made Pottery.—The fragment found in the Bone Chamber and figured on plate (fig. 1), is only of small size, measuring 1in. by 1¼in., and is of rude but fairly good thin ware of the "drinking-cup" or "beaker" type. The outer surface is ornamented by a number of parallel lines showing the characteristic cord-pattern, enclosing a narrow area decorated by a

* *Trans. Lanc. & Ches. Antiq. Soc.*, vol. xxvii.

trellis-design evidently incised on the wet clay by means of a pointed instrument.

As to the date of this class of pottery much confusion appears to exist. As pointed out by Sir Charles Hercules Read,* in his reference to some fragments of ornamental pottery from a primary interment in a long barrow at West Kennet, Wilts., it is difficult to assign even a relative date to the prehistoric pottery of this country. Neither the comparative coarseness of ware nor the nature of the ornament enable us to determine with certainty between the products of successive periods and the pieces illustrated from the Wiltshire long barrow which are practically indistinguishable from the pottery usually assigned to the Early Bronze Age. Other authorities are equally emphatic on this point.

It is a significant fact that all the varieties of the "drinking-cup" type of pottery are on the Continent definitely assigned to the Neolithic period.†

FLINT FLAKES.—Several flakes of flint and black chert were met with, associated with the human remains, in the Bone Chamber. Most of them, however, are mere chippings and of small size, but two examples—one of flint and the other of chert—are somewhat larger in size. The flint flake measures 3in. by 2in., is white in colour, and highly patinated all over its surface. Around the edge are slight traces of secondary chipping. The chert flake is $2\frac{1}{2}$in. in length by $1\frac{5}{8}$in. in breadth, and possesses no evidences of secondary work. The material is black in colour, and very like some of the flakes met with on the Neolithic floors around Rochdale, &c. One of the other

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* *Brit. Mus. Stone Age Guide*, 1902, pages 113-115.
† *Brit. Mus. Bronze Age Guide*, 1904, page 44.

flint flakes shows signs of chipping round its edges and somewhat resembles a small scraper.

Though, on the whole, of no very great significance as to date, their discovery is of considerable interest, and may be taken to connote, with some degree of probability, the existence of a local flint-working industry somewhere in the immediate neighbourhood, as well as an indication of a primitive form of commerce, since no natural flint is to be found except at considerable distances from the Warton area. Many of the flakes undoubtedly represent chippings knocked off in the manufacture of implements, and the source of the material can only have been from the boulder-clay of the Lancashire low-lands, or, what is more probable, from the flint-bearing chalk of the East Riding of Yorkshire and elsewhere.

Weaving Comb.—As previously stated, a most interesting find was made in one corner of the Bone Chamber in the form of a weaving-comb made from a portion of red deer antler. It measures 116mm. (about 4½in.) in length. The back is rounded, following the natural curve of the antler; handle rather thick, but thinning out towards the dentated end, which is 35mm. in breadth. This end possesses eight teeth of an average length of 22mm. From behind the teeth the comb gradually diminishes in breadth down to 17·5mm. at the basal end. Here the comb is completed by an oblong enlargement measuring 33mm. by 13·5mm. This enlargement is without the usual perforation, and is ornamented by a border of single incised grooves parallel to all four sides, enclosing two sets of crossed lines forming a trellis pattern. The handle is then plain for a distance of 36mm., when it is crossed by two parallel transverse lines followed by trellis design divided and completed by other parallel transverse

lines. The ornamentation is continued to almost half the length of the teeth, from which it would appear that the comb was originally much longer, and the teeth becoming broken or shortened by wear, the interdental notches were cut back and a new set of teeth thus formed (plate, fig. 4). The entire surface of the comb is glazed over by a thin film of stalagmitic matter which has been instrumental in preserving it from decay, though it has obliterated the ornamentation to some extent in places.

The comb agrees in many respects with similar objects met with in excavating the Late-Celtic lake village at Glastonbury; more especially does it resemble H65 figured in the recent Glastonbury volume.* According to this excellent work combs of rather a different type, with the handle-end squared or roughly rounded off, have been met with in the north of England at several places. One was found at Lancaster in 1850 associated with Roman remains, and is now in the Liverpool Museum. This specimen is unornamented, but the dentated end possesses the unusual number of sixteen teeth, of which ten remain perfect. Others have been found as follows: One near Stanwick Church, North Riding, Yorks., with Late-Celtic remains; another of same type, with seven coarse teeth complete, was found in the Roman baths at Hunnum, Haltwhistle, Northumberland; while others were discovered in the Dowkerbottom Caves at Craven, Yorks.

Iron Weaving Comb (?).—In my first report on this cave (1910, page 12) I recorded the discovery in the Bone Chamber of a fragment of iron with teeth, which from its general appearance suggested part of a trap, probably dragged in by some wounded animal. In last

* *The Glastonbury Lake Village*, vol. i., 1911, plate xlviii.

year's diggings I fortunately discovered another fragment, which was found to fit on to the broken part of the toothed portion met with previously. The completed object is figured on plate (fig. 6) of the present report, and has the general appearance of having been some sort of comb. It is 106mm. (4⅛in.) in length and 56mm. at one end. This, the widest part of the comb, is turned up at right angles, and bears a row of sixteen teeth, broken off quite short by oxidation. The opposite end thins away to a mere tang, and was no doubt inserted into a handle of horn or bone. There is a possibility that the object represents an early weaving-comb, and it is of interest to compare it with an iron weaving-comb found in the fort of Dunadd, Poltalloch Estate, Argyll.* This latter, probably the only long-handled weaving comb of iron of early date that has been so far discovered in Britain was found associated with relics of Celtic type, but post-Roman. It measures 6¼in. in length, and comprises a tang of 3¼in. and a broad-toothed end measuring 3in. long by 3¼in. broad, the whole being in a straight line and not turned up as in the Dog Holes example.

Iron Objects.—The iron objects met with in the neighbourhood of the foot of the Shaft are all in a highly oxidised condition. The four nails, the longest being 3½in., possess large heads, and are similar to those figured previously from this cave.† A flat bar of iron, 4in. in length by about ½in. in width, has the appearance of having been a bolt or similar fastener to a box or door. Another object, 3½in. in length, is not unlike a key minus

* *Proc. Soc. Antiq. Scot.*, xxxix., p. 317, f. 51; also *Glastonbury*, vol. i., p. 268, f. 56.

† *Trans. L. & C. A. Soc.*, xxviii., 1911, fig. 6 of plate facing page 72.

the loop, the stem being solid and not piped.* The remaining objects comprise an iron ring, 1½in. in diameter and ½in. deep; two irregular lumps of iron with charred timber attached to their surfaces; and an interesting fragment retaining the impression of some textile fabric (see plate, fig. 3). Many of the above look as if they had all been part of an iron-bound box which had been destroyed by fire.

Bronze Objects.—The detailed descriptions of the bronzes met with in the vicinity of the Shaft-foot during last year's diggings are as follows: No. 1 consists of a round button, 1¼in. in diameter. The face is ornamented by a central boss and an outer raised ring situated well within the edge (=dot and circle design). The back possesses a short rounded shank placed centrally and at right angles to the face. To this shank is attached a triangular flattened loop, which runs parallel with the face of the button, and reaches ⅜in. beyond its border. The width of the broad end of loop is ¾in. The exact application of this interesting object is uncertain, but it may possibly have been some sort of dress or cloak fastener, a conclusion arrived at with regard to a number of somewhat similar objects met with elsewhere, especially in the Glastonbury lake-village and the Roman fort at Manchester.† The second bronze object from Dog Holes appears to be part of the binding of the lower end of a sword-scabbard. It consists of a thin sheet of bronze, 2in. in length and 1⅝in. in width, one edge being broken away in an irregular manner. The surface possesses a similar Late-Celtic embossed design to that present on the

* Similar to fig. 52, plate 97, *Roman Fort at Manchester*, 1909.

† See *Glastonbury*, vol. i., pl. xlii., fig. E151 for example; also *The Roman Fort at Manchester*, 1909, pl. 90 and 92.

bronze mount figured previously from this cave.* The lower end is perforated with a round rivet hole. Both the above objects are figured on plate (figs. 7 and 9).

LEAD.—A thin strip of lead was found at the Shaft-foot in the course of digging out one corner. It measures $3\frac{3}{4}$in. in length and $\frac{3}{4}$in. in width, the surface being much weathered. The precise application of this object is doubtful.

BONE.—The remaining objects of interest met with at the Shaft consist of—(*a*) A bone awl, $3\frac{3}{4}$in. long, made from the leg-bone of a sheep or goat; this is similar to that figured in my previous report.† (*b*) Two bone pins, excellently finished, one measuring $3\frac{5}{8}$in. and the other nearly 2in. in length (plate, figs. 2 and 8).

The boar's tusk found with the human remains in the Bone Chamber is $4\frac{1}{4}$in. long measured along the outer curve, and at its upper end bears a perforation for suspending the object (plate, fig. 5).

(*b*) HUMAN REMAINS.

The human remains met with in the Bone Chamber in 1912 represent at least nine individuals of various ages. They are of extreme interest, containing, as they do, bones which represent an individual of exceedingly small stature, as well as a further example of a lower jaw which is remarkable in being without traces of alveoli for the second premolar or bicuspid teeth on either side. In my "Preliminary Report" to this Society,‡ I recorded a similar absence of premolars in a human lower jaw, but

* *Trans. Lanc. & Ches. Antiq. Soc.*, vol. xxviii., 1911, plate facing p. 70, fig. 3.
† *Ibid*, vol. xxviii., 1911, fig. 3 of plate facing p. 72.
‡ *Ibid*, vol. xxvii., 1910, page 15.

owing to some inadvertence it was stated that the first premolar on either side was absent. This remark needs correction, as the second premolars are missing, the first premolars being in their proper places. Both jaws have doubtless possessed these teeth early in life, and on their extraction their sockets became closed up by bone.

This remarkable absence of premolars is noteworthy in being, so far as I can ascertain, the first recorded occurrence in the British Isles, if not in Europe. The only evidence of missing teeth in British fossil human remains appears to be that of the famous and much disputed Galley Hill skeleton, described by Mr. E. T. Newton in 1895.* In his description of the lower jaw the author remarks: "On each side of the symphysis the alveolar border is broken; but while portions of the alveoli for the two outer incisors are preserved, there are *no traces of the alveoli for the two median incisors*,† which must have been either very short or else lost during life, and the alveoli filled up by bone." Whether any significance can be attached to these cases of dental mutilation is a problematic question, to which I shall have occasion to refer on a later page.

In close proximity to the mutilated jaw, found in 1912, was a portion of the upper maxillary and the greater part of a human cranium. The latter consists of nearly the whole of the calvarium; the facial portions below the supra-orbital border and the whole of the base being wanting. It is long-headed and somewhat oval in shape, with distinct evidence of having possessed a rather prominent occiput or probole; forehead rounded from side to side and moderately receding; sutures fairly distinct. The greatest width of the frontals is about

* *Quart. Jour. Geol. Soc.*, vol. 51 (1895), page 508.
† The italics are mine.—J. W. J.

112mm.; the least width about 106mm. The highest point of the skull is near the centre of the parietal region, and it attains its maximum width near the middle of the parietal; occipital bone bulging, with a somewhat flattened area at its junction with the parietals. The greatest length of the skull is 182mm.; the greatest breadth, 135mm., giving a cephalic, or breadth, index of ·741; the skull being, therefore, of the dolichocephalic type. The average thickness of all the bones is 6mm. In general shape and contour it bears a strong resemblance to the Tilbury cranium,* and to other well-known "river-bed" types.

The lower mandible found alongside is without traces of the sockets for the second premolars on each side. The last true molar, or wisdom tooth, has not yet put in its appearance, but the two remaining molars are present on each side, as well as the first right premolar, the remaining teeth, except the second premolars, being represented by their sockets. The body of the ramus gradually slopes to the chin, which is rounded and not prominent; the depth at the symphysis is 30mm.; behind the first premolar, 24mm., and behind the second molar, 25·5mm. The breadth of the jaw immediately behind the second molars is 47·5mm. The ascending ramus is somewhat broad for the size of the jaw, and possesses only a medium sigmoid notch.

The fragmentary upper maxillary consists of a small piece of the right jaw, containing two molars and two premolars, the wisdom tooth not being present. As in the lower jaw, all the teeth are considerably worn.

From the general conformation of the above skull and the weakness of the accompanying mandible, Dr. G.

* See Keith *Ancient Types of Man*, London, 1911, fig. 4.

Elliot Smith, of the Victoria University, is inclined to refer the remains to the female sex, while the lower jaw, with the missing premolars found in 1909, he regards as belonging to a male person. The age of the 1912 individual can be approximately determined by the absence of the last true molars, these teeth, according to Owen,* usually appearing between the seventeenth and twenty-first year. The individual, therefore, can only have been adolescent, and probably not more than sixteen years of age. Unfortunately, the numerous skull fragments among the other human remains from the Bone Chamber are either too juvenile or not sufficiently perfect for measurements to be taken. In general appearance, however, they agree with the remains described above.

Amongst the remaining bones found last year are three lower jaws, which are in a fair state of preservation. One of these (No. 1) is remarkable for the breadth of the ascending ramus and the shallowness of the sigmoid notch, indicating a very early type of human jaw. The extreme width of the ascending portion is 48mm.; measured in line with the teeth, 38mm. The height from the coronoid process to a point on the horizontal ramus immediately below is 51mm., while the articular condyle is only slightly higher than the coronoid. Viewed from below, the arch formed by the two halves of the jaw is decidedly V-shaped, the chin being pointed; whilst the point of attachment of the lingual-muscle is scarcely apparent. The depth of the jaw at the symphysis is 27·5mm.; behind the first premolar, 28·5mm., and below the third molar, 26·5mm. The length and breadth of the lower bite, measured by Dr. Keith's method,† is 43 and 61mm. respectively. According to Dr. Keith, the

* *Comp. Anat. & Physiol. Vert.*, London, 1868, vol. iii., page 326.
† *Ancient Types of Man*, London, 1911, page 41.

measurements of the lower bite in modern Englishmen are 46 and 68mm.

All the teeth are present in the above jaw with the exception of the second premolar of the left side and both third molars, but these teeth are represented by their sockets. All the teeth are well worn and crowded together, so much so that the canines have assumed a somewhat transverse direction. In the incisors the crowns are worn quite flat, indicating that they were set edge to edge with the upper ones, and not as in present day examples with the lower ones passing behind the upper. The jaws could thus be moved easily from side to side in grinding food.

Lower jaw No. 2 possesses a square and prominent chin, and is also quite adult, the wisdom teeth being present on each side, but, while that on the left is equal in size to the adjacent molars (length, 10mm.), that on the right is 1mm. less in length than the teeth next to it. All the teeth are well worn. The lingual-muscle attachment is large and prominent, and the depth at the part of the jaw—the symphysis—is 30mm., and below the third molar, 24mm. The length and breadth of the bite, measured as in No. 1, is 40 and 68mm. respectively. The ascending ramus is much narrower than in No. 1 jaw, and the sigmoid notch appears to have been deeper, though owing to its broken condition one cannot be certain.

Lower jaw No. 3 has the chin and angle rounded off, the sigmoid notch deep, and the ascending ramus narrow and very much inclined backwards, thus throwing the coronoid process well above the level of the condyle. The jaw is fully adult, the wisdom teeth being present on the right side, and showing a fair amount of wear. This tooth, however, is much smaller than the adjacent molars,

being only 8·5mm. in length, or 1½mm. less than the others. The depth at the symphysis is 34mm., and below the third molar, 31·5mm.; the length and width of the bite approximately 41 and 68mm.

The following are also represented amongst the remains: (*a*) An imperfect adult upper jaw with well-worn teeth, the incisors being worn flat on their crowns. The palate is arched and measures 39mm. in breadth opposite the last molars. This fragment does not fit any of the jaws described above. (*b*) Two left upper maxillaries of children containing the milk-teeth, D.M. 3 and 4 in place (unworn), and M1 in its crypt, the age of these being, therefore, somewhere between three and six and a half years. (*c*) An imperfect lower jaw of a child about fourteen months old, D.M. 3 having just appeared. (*d*) The left ramus of the lower jaw of a very young infant, the symphysis being unjoined.

Amongst the limb-bones are one or two which call for special remark, particularly those of the dwarf skeleton. Only four bones of this individual are sufficiently perfect for measurement, and these are a left tibia (length 305mm.), a left fibula (length 292mm.), a left radius (length 226mm.), and a right humerus (length 258mm.). Both thigh-bones, unfortunately, are minus their proximal extremities, but are distinctly smaller than the shortest adult femur (length 393mm.) from the Cefn tumulus (now in the Manchester Museum). This can be proved by taking the distance between the condyles and the commencement of the great trochanter; in the Dog Holes specimen this is 313mm., while in the Cefn example it is 343mm. In all probability the Dog Holes femora were about 365mm. in length when perfect.

Adopting Rollet and Topinard's formulæ for calculating the height, as used by Mortimer in his *Forty Years'*

Researches in British and Saxon Burial Mounds of East Yorkshire, we get the following results: Femur and tibia combined, 1·359 metres (or 4ft. 5½in.); femur only, 1·337 metres (or 4ft. 4¼in.); tibia only, 1·386 metres (about 4ft. 6½in.); humerus only, 1·290 metres (or 4ft. 2¾in.), giving an average height for the dwarf of 4ft. 4¾in. The bones are very slender and ill developed, but otherwise normal; there is no sign of disease, such as rickets; all the epiphyses are united, showing that growth was complete. The age of the individual at death would be about twenty-five years. Dr. Elliot Smith has examined the bones, and remarks on their small size and the apparent absence of pathological conditions.

With the exception of the above dwarf all the human remains so far discovered in the Bone Chamber at Dog Holes agree very closely in general characteristics with those obtained by Professor Dawkins from the Neolithic burials in the Perthi Chwareu and Cefn caves.* They also resemble some of those from the sepulchral cave at Gop, near Prestatyn, North Wales.† In this latter cave indications of two distinct racial types were met with, one being the earlier Iberic race, represented by at least eight skulls as well as limb-bones; the other, the invading round-headed Celtic race, represented by two fragmentary skulls and numerous limb-bones. The majority of the bones of the latter indicate a tall race of people analogous to those of the round barrows and of an average stature of 5ft. 9in.,‡ while those of the Iberic race are more in keeping with the long barrow people, as their height, as deduced from their femora, is about 5ft. 4in. None of

* *Cave-Hunting*, 1874, "Description of Human Remains," by Professor Busk, pp. 166-187.

† *Archæol. Journ.*, lviii. (1901), pp. 322-341, and *Archæologia Cambrensis*, sixth ser., vol. ii. (1902), pp. 161-181.

‡ See Thurnam, *Mem. Anthrop. Soc.*, London, iii. (1870), p. 41.

the Dog Holes bones indicate a higher stature than this, and in the absence of any signs of mixture one can reasonably assume them to be all of one race.

The human remains met with at the Shaft-foot and in the North Passage were few in number and in a very fragmentary condition. Those from the Shaft consisted solely of portions of skull, while those from the North Passage included limb-bones as well as fragments of skull. These probably represent portions of the imperfect skeletons found previously in this part of the cave. They all belong to robust individuals, and, in all probability, are to be referred, from their position, to a burial some time previous to Romano-British times. That this has been disturbed is evidenced by the discovery in 1910 of the curiously broken left femur described in my "Further Report" on this cave.* This specimen is remarkable from the fact that the lower part is broken off with a clean oblique fracture similar to the various animal bones split for the marrow. The fracture of this specimen, however, is not necessarily indicative of cannibalism. That it is post-mortem and of long standing there appears to be no doubt, and the most probable solution is that the bone was rooted up by some dog and broken by later occupants of the cave, and then used as a scraper or digger, the broken end, which is pointed, showing every indication of such a use.

(*c*) ANIMAL REMAINS.

The most interesting of the animal remains met with in last year's diggings were obtained from the Bone Chamber and are referable to the same age as the human remains. As some of these present noteworthy

* *T. L. & C. A. Soc.*, vol. xxviii., 1911, p. 74.

features a few remarks will be given below, together with notes on other animal remains found elsewhere in the same cave.

CARNIVORA.—*Wolf (Canis lupus):* Further evidence of this animal among the Dog Holes bones was obtained last year in the form of a penial bone measuring 91mm. in length, found at the foot of the Shaft. This is doubtless part of the same skeleton found in the North Passage previously, and described in the 1911 report (page 75).

Dog (Canis familiaris): This animal is only represented by a few remains from the Fissure, below the charcoal layer at the Shaft, and by others from the Bone Chamber. Those from the first situation comprise the greater part of the skeleton along with the lower jaws and imperfect skull, all belonging to a dog of small size. Those from the Bone Chamber consist of three imperfect adult lower jaws and two juvenile examples, also numerous loose molar and canine teeth. The adult jaws are strongly built, and the molar areas measure 72·5mm. and 74mm. in length. The jaws are too imperfect for further measurements to be given. In the same situation as the jaws were found a left femur measuring 172·5mm.; a left tibia, 195·5mm.; and three radii, 197mm, 179mm., and 156mm. in length. A right femur was also met with which had been broken and had set itself by overlap.

UNGULATA.—*Celtic Shorthorn (Bos longifrons):* Among the bones from the Shaft are several broken lower jaws belonging to oxen; also a pair of horn-cores, length along upper curve 135mm., circumference at base 136mm., and a metacarpal bone measuring 175mm. in length and 51mm. in breadth at the lower articulation, this being only slightly smaller than a similar bone of a Chillingham

cow given in Table I. of Professor Meek's paper on the "Animal Remains found at Corstopitum."* The ox is also represented among the remains found in the North Passage by several loose teeth and by the following bones: A metacarpal, length 166mm.; lower articulation, 49·5mm.; two metatarsals, length 191mm. and 231mm.; lower articulations, 43mm. and 54·5mm. respectively. The two latter bones appear to be much older than the other remains, being darker in colour.

The remains of ox found in the Bone Chamber are somewhat more numerous and of greater interest, owing to the range of variation they present. Amongst the collection are several fragments of upper and lower jaws with teeth, also numerous loose teeth, varying so much in size that it is difficult to decide on their specific identity with *Bos longifrons* as generally understood. One lower jaw from here has a tooth area of 152mm., the teeth being much larger than in the jaws of *Bos longifrons* found previously in this part of the cave, or in the Swirl Hole and foot of the Shaft (see 1910 report, page 25). These latter appear to have belonged to animals of the size of the Kerry cow, while the 1912 jaw represents an animal little inferior in size to the Welsh cattle of to-day.†

Amongst the loose teeth is a third upper molar in which the internal column is entirely absent as in Professor Meek's new species, *Bos sylvestris*.‡ This species was founded in 1910 upon material obtained at Corstopitum, and is characterised by the absence of the first premolar in the lower jaw and the absence from the third upper molar of the internal column found in *longifrons* and other domesticated forms. The above

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* *Archæologia Æliana*, third series, vol. vii., 1911.

† Compare Meek, *op. cit.*, Table I.

‡ *Op. cit.*, pages 103-5.

species is represented at the present day by the Chillingham herd (Meek).

Nearly all the limb-bones (even the metacarpals and metatarsals) of the ox from the Bone Chamber have been broken in order to extract the marrow, and are, therefore, not available for measurement. A left tibia, however, though broken in half, can be fitted together, and gives a length of 320mm., with a width for the lower articulation of 54mm., which is approximately the size of a corresponding bone in a present day Chillingham cow. Almost all the other bones, however, represent animals of much larger size almost up to that of a modern shorthorn. From the foregoing remarks it will be evident that several different types of cattle are represented among the collections from the two widely separated horizons at Dog Holes.

URUS *(Bos primigenius):* The presence of this animal is again indicated by several very large bovine teeth and by one or two fragmentary limb-bones, all obtained in the Bone Chamber. The teeth are quite as large as those found in 1909 in this portion of the cave. The limb-bones had been broken for the marrow, as in the other animal bones, and, therefore, no idea of their length can be ascertained. In two of the bones the widths of the distal articulations are as follows: right radius, 80mm.; right humerus, 83mm. Amongst the remaining bones are an astragalus (maximum length, 94mm.), a scapho-cuboid, and one solitary distal articulation of a large metatarsal. All three bones are quite equal in size to the corresponding bones of Bison from Windy Knoll fissure, now in the Manchester Museum.

SHEEP *(Ovis aries):* The remains of sheep were mainly noticed in the Bone Chamber, but were by no means

common. Two radii found here measure respectively 153 and 156·5mm. in length, while a humerus gives 128mm., a calcaneum 67mm., and a broad metacarpal 103mm., the distal end of this latter bone being 26mm. wide and the least width of the shaft, 15mm. In general aspect this bone resembles a more modern type of sheep than the small long-legged breed of Romano-British and earlier times.

RED DEER *(Cervus elaphus):* Amongst the bones obtained in the Bone Chamber are a number of immature leg-bones and several fragments of a large antler, which are referable to this animal.

ROEBUCK *(Capreolus caprea):* This animal is represented by an almost perfect shed antler, several limb-bones, and a few teeth, all found in the Bone Chamber. The bones and teeth are remarkable for their large size, being almost equal to those of an average fallow-deer. They seem to agree, however, better with those of the roe, and may indicate a large breed formerly inhabiting the district. Measurements of some of the bones are as follows :—

	Femur.	Tibia.	Metatarsal.	Metacarpal.
Length - - - - -	204	256 (Ca.)	207	175mm.
Width of distal end -	40	28·5	26	23mm.

HORSE *(Equus caballus):* This animal is merely mentioned here to call attention to its extreme rarity in the Bone Chamber. No remains were met with last year, and only one adult lower molar and several uncut upper molars were discovered previously (1909), in this portion of the cave. Two upper molars and a metacarpal, measuring 211mm. in length (width of lower articulation, 46mm.) were found in last year's diggings in the North Passage, while from the Fissure below the charcoal bed

at the Shaft were obtained a broken radius and humerus, two plastron, and two coronet bones. The above-mentioned metacarpal appears to indicate an animal about the size of a New Forest pony.

Pig *(Sus scrofa domesticus)*: The lower jaws of young pigs were fairly numerous in the Bone Chamber. Here also occurred an imperfect juvenile skull and one or two split limb-bones of adults. The only perfect bone found was a left tibia, measuring 187mm. in length, the width of the distal articulation being 30mm.

Concluding Remarks.

As further explorations in this cave may not be carried out for some considerable time, owing to the estate having changed ownership and the cave being now walled up, it will be of interest at this stage to briefly outline the work so far accomplished.

The excavations date back to October, 1907, when it was first demonstrated that the cave contained relics of a past period. On this occasion I had the good fortune to discover a number of human and animal bones, as well as a large fragment of Late-Celtic pottery. This interesting discovery led me to think that the cave would repay more systematic examination, and ultimately I was able to arrange with the landowner, Mr. E. B. Dawson, of Lancaster, for this work to be carried on. It was not, however, until the summer of 1909 that I was able to conduct extensive diggings in the cave, and it is only right to mention that on this occasion the greater portion of the expense was generously borne by Mr. Dawson himself. Later investigations were carried out in 1910 and 1912 under the auspices of this Society and the

Cumberland and Westmorland Archæological and Antiquarian Society, assisted financially by numerous other friends. The results of the 1909 and 1910 explorations have already been published in the pages of this journal,* while those of 1912 are embodied in the present paper.

It is particularly fortunate that Mr. Dawson was able to retain possession of the cave until last year's investigations were completed, since the interesting material obtained on that occasion renders it possible to sum up the history of the cave and its surroundings without waiting for further explorations. At least three distinct periods can be satisfactorily determined, the first being of considerable interest and importance, as it deals with the age of the cave-earth from which so many remarkable vertebrate and invertebrate remains have been obtained. This epoch, however, has already been discussed in a series of papers published in the *Lancashire Naturalist* for 1909 and 1910.

From the evidence of the occurrence of the remains of four extinct British rodents, viz., the Arctic and Norwegian lemmings and the northern and Siberian voles, together with the shells of an Arctic-Alpine snail (*Pyramidula ruderata*), all of which are so far only known in this country from Pleistocene deposits, the age of the large accumulation of cave-earth has been relegated to that remote period. This evidence, however, is perhaps not altogether to be depended upon, since it seems possible that these small animals may have lived on into later times, though no reliable evidence is at present available of this having taken place. So far as the investigations have gone no evidence has been obtained of the cave having been used

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* *Trans. Lanc. & Ches. Antiq. Soc.* (1910), vol. xxvii., page 1; (1911) vol. xxviii., page 59.

as a den by any of the larger carnivores of the Pleistocene period, such as the hyæna. The absence, however, of this animal may be due to the fact of the cave not presenting a suitable entrance at the time that this animal lived in Britain. The absence, also, of the larger mammals, such as the mammoth, rhinoceros, &c., is in keeping with the absence of the hyæna, since the latter is responsible, on the whole, for the remains of the larger mammals found in the caves explored in Britain.

Presuming then, on the present evidence, that the cave-earth is of Pleistocene age, the next question to be dealt with is that of the human remains. The large number of these found together in such a narrow chamber (representing twenty or more individuals) seems to point to the cave having been resorted to for burial purposes at various times. All the bones were discovered embedded in the cave-earth, containing remains of extinct British animals. The lower jaws of the reindeer and the teeth and fragmentary limb-bones of the urus (*Bos primigenius*) were also found in the same earth. From the association, however, of the humans with the lemmings, &c., it is not to be immediately inferred that they are to be attributed to the same period, though numerous conclusions to this effect can be cited both in this country and abroad, great stress being especially laid on the presence of the remains of the reindeer.

In my opinion it seems much more reasonable to look upon the humans as intrusive and belonging to a later period, and this conclusion is strengthened by the presence in the cave-earth of domestic animals, such as *Bos longifrons*, dog, pig, sheep, and goat, which from their close proximity evidently represent the usual propitiatory gifts to the spirits of the dead, or the relics of funeral feasts. With the doubtful exception of *Bos longifrons*,

the above animals have no place in the lists of known remains from Pleistocene deposits, and all finds with which they are associated are referred by leading authorities to Neolithic or later times. If, therefore, it be accepted that we are dealing with burials in later times, it remains to discover to what part of the Prehistoric period the Dog Holes humans can be attributed. The animal remains, both of wild and domestic species, are not of themselves conclusive evidence of any one stage of the Prehistoric period, since most of them lived on through the Neolithic and Bronze Ages until later times. The remains of the reindeer and urus, if these really belong to the burial, may perhaps indicate an earlier division, but more evidence is needed on the range in time of both these animals. The flint flakes and the fragment of rude pottery are also no criteria as to date. We are thus thrown back upon the human remains themselves.

As has been seen in the foregoing pages, these present some most interesting features, but, unfortunately, out of the total number discovered in the Bone Chamber, only one skull is in a sufficiently perfect state to give any idea of cranial contour. This is decidedly of the "river-bed" type, and in all its features agrees with the Iberian race of leading authorities. The same remark applies with equal force to the lower jaws and the other fragmentary skulls. When we examine the limb-bones we find that they also compare favourably with those of the small Iberic inhabitants of Britain in Neolithic times. It seems, therefore, quite reasonable to conclude that we have at Dog Holes another instance of a cave being used as a sepulchre by Neolithic people, as in the Perthi Chwareu and other North Wales caves.

Before closing the discussion of the human remains it will be of interest here to give a few further remarks on

the interesting finds of the dwarf skeleton and the two lower jaws with missing premolars. The discovery of the dwarf recalls the remarkable find, between 1892 and 1896, of a Neolithic pygmy colony at Schweitzersbild, Switzerland. In a bed, which apparently represents the beginning of the Neolithic, were found nine normal skeletons and five pygmies.* This discovery at the time aroused special interest and gave rise to much speculation. By some authors these dwarfs were looked upon as representing the earliest inhabitants of Europe, but this theory has not met with universal acceptance, nor is it consistent with what is now known of early Palæolithic remains. Other writers saw in them a connection with the finely chipped implements of abnormally small size—the so-called "pigmies"—found so abundantly in many parts of England (Lancashire moors, &c.), and in different places on the Continent, in India, North Africa, &c. This far-reaching conclusion, however, has been ably controverted by several authorities as altogether unreasonable, and I would refer the reader to Mc.Cabe's *Prehistoric Man*, and to a most instructive paper by Messrs. Sutcliffe & Parker,† for more information on this point. As pointed out by Mc.Cabe, these pygmies "may merely represent a sporadic invasion from Africa," and until further evidence is forthcoming it seems preferable, on the whole, to look upon them in this light. It might be mentioned in passing that the smallest race amongst the Central African dwarfs averages about 4ft. 3in. in height (like the Schweitzersbild skeletons), the Dog Holes dwarf, as stated previously, is about 4ft. $4\frac{3}{4}$in. The dental mutilations in the two lower jaws open up a wide field for speculation,

* See Mc.Cabe, *Prehistoric Man*, n.d., page 75, and other works.

† *Lancashire Naturalist*, February, 1912, pages 359-364, and present volume of these *Transactions*.

in view of the widespread occurrence of similar practices among certain African tribes at the present day. Dr. W. L. H. Duckworth* has recently described an Ashanti skull, in which the four upper incisors had been removed, evidently in early childhood. He further states that Dr. Sergi met with the occurrence of the complete removal of all of the upper incisor teeth in seven out of a collection of twenty-nine crania from rock-hewn tombs in Abyssinia. The tombs are referred to the fifth century A.D., and the crania are said to represent a Hamitic, *i.e.*, non-negroid stock. As shown by Sergi and others, the practice of removing incisor teeth, and more especially those of the upper set, is characteristically East African. The Ashanti skull is still more remarkable from the fact that the first molar tooth of the upper set has also been lost on each side, the small amount of wear on the corresponding lower teeth (M1), the crowns of which are elevated above those of the adjacent molars, showing that the upper first molars were lost at an early date.

Sir Harry Johnston,† in speaking of the Masai people, states that "almost all the men and most of the women knock out the two lower incisor teeth, a very ancient custom inherited from the Nilotic stock, which was their origin, for amongst these people the removal of the lower incisor teeth is a very common practice." The same writer also states that the Bantu Kavirondo, and the Ja-luo, usually pull out the two middle incisor teeth of the lower jaw (*op. cit.*, page 728), and it may also occur amongst the latter people, as amongst the Lango tribes to the north, that not only the four incisors, but even the canines are taken out, at any rate from the mouths of boys (*op. cit.*, page 783). The custom of extracting the

* *Journ. Anat. & Physiol.*, vol. xlvi., April, 1912, page 215.
† *The Uganda Protectorate*, vol. ii., page 803.

four lower incisors is also prevalent amongst the Banyoro, a mixture of Hamitic and Nilotic elements, the practice, no doubt, having been learnt from the neighbouring Nilotic tribes (*op. cit.*, page 581).

Dr. Elliot Smith* also records the discovery, among Ptolemaic-Roman burials in Nubia, of a skull of a negress with all the lower incisors removed, and remarks that the practice of removing these teeth appears to be generally derived from the Dinka and allied Nilotic populations.

Outside Africa we have evidence of similar practices among certain of the native tribes of Australia. These people not only practice a sort of tattooing, but are in the habit of extracting both upper incisors, occasionally varying it by taking out the right only and sometimes the left. This is done at the time of puberty and forms part of the ceremonial of initiation. In some Australian tribes this initiatory rite appears to have been entirely superseded by other rites.

From these and other analogies relationship has been inferred by some writers between the primitive Australian and African tribes, but this conclusion is combated by other authorities. Of the origin of the Australians nothing definite appears to be known, but it seems to be generally accepted that their ancestry goes back to a remote period, and it is thought by some that they may even have lived in that continent as long as the Basques have done in Europe. It is a matter, therefore, of considerable interest and importance to find evidences of dental mutilations in two of the Dog Holes skeletons, and the question which naturally arises in one's mind is how these early people acquired such a practice and whether any significance can be attached to its occurrence.

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* *Arch. Surv. Nubia*, Bull, No. 5, 1910, page 23, &c.

A definite answer to these very interesting problems is impossible in the present state of knowledge. That we have here a custom borrowed from neighbouring people and handed down is not at all improbable, but rather than enter into a wilderness of speculation it seems preferable to leave the question for future investigations to decide.

The final period in the history of Dog Holes is that represented by the Romano-British relics found in the surface soil. In the various remains discovered at the foot of the Shaft we have every indication of this part of the cave having been used as a dwelling or hiding-place for no short period, and the relics themselves give us no small insight into the rough life of these cave-dwellers. The numerous broken bones of sheep, goat, ox, pig, &c., surrounding the well defined charcoal layer, tell us something of their staple food, which appears to have been varied occasionally by the horse and deer. The unbroken bones of the dog show that this animal did not contribute to the bill of fare, but was, no doubt, the attendant of the cave-dwellers and used for hunting purposes.

Fragments of pottery strewn about among the bones and charcoal indicate to us the different types of cooking vessels in vogue during the early part of the Roman domination. They are all of well-known first century forms, showing Late-Celtic influence, and are such as have been met with in similar situations elsewhere.

From the weaving-combs found in the Bone Chamber one might infer that some sort of weaving was carried on in this part of the cave by one or other of the cave-dwellers, but this conclusion is by no means certain, as they may be merely objects treasured by one of the party and belonging to a time when weaving was carried on under more genial conditions.

The small iron sickle (figured in my second report, 1911) was obviously used for cutting off the ears of corn, and this would imply the presence of crops somewhere in the vicinity. An almost similar object found at Wookey Hole, Somerset, is figured in the *Archæologia*, 1911 (page 576, pl. 78, f. 13). In both examples the socket is folded over and open at the top, and there are traces of the wooden handle having been rivetted on.

The situation of the hearth below the cave-mouth was a decidedly convenient one, as the smoke from the fire had free passage up to the open air, leaving the atmosphere of the cave perfectly clear.

From the scant traces of personal ornaments and articles of luxury it would appear that the inhabitants had not attained any high degree of culture, but were rather a race of hunters and cattle keepers, and the whole evidence seems to suggest that the cave-dwellers were hostile and independent Britons driven to the uplands on the advance of the Romans, and eking out a miserable existence in the cave, varied to some extent by raids in search of plunder. The discovery in 1910 of the beautiful pair of bronze balances in such a situation certainly lends colour to the latter supposition. Hence we may take it that such a life was preferred rather than allow themselves to be inevitably enrolled in the imperial army and drafted far away from kith and kin, a practice which we know was carried out by the Romans in this and other provinces which they conquered.

What caused the final abandonment of the cave is difficult to decide. It is probable that the cave-dwellers were eventually cleared out by the Romans themselves or by other marauding bands.

Synopsis of the various Archæological Remains obtained at Dog Holes during 1907-1912.

	Romano-British.	Neolithic.
Late-Celtic pottery	×	–
Rude pottery	–	×
Flint flakes	–	×
Weaving-combs	×	–
Bronze scales	×	–
Enamelled bronze pendant	×	–
Bronze dress fastener	×	–
Bronze scabbard bindings	×	–
Iron sickle	×	–
Iron nails, knives, &c.	×	–
Bone awls, &c.	×	–
Hammer-stone	×	–
Whetstone	×	–
Pick of deer-antler	–	×
Cockle shells	×	–
Boar-tusk pendant	–	×
Man	–	×
Wolf	×	–
Dog	×	×
Fox	×	×
Badger	×	–
Cat	×	–
Common hare	×	–
Celtic Ox	×	×
"Bos sylvestris"	×	×
Urus	–	×
Sheep	×	×
Goat	×	×
Roebuck	× (?)	×
Red deer	× (?)	×
Fallow deer	×	× (rare)
"Irish elk"	–	× (rare)
Reindeer	–	×
Horse	×	× (rare)
Wild boar	–	×
Domestic pig	×	×

The above list comprises all the remains met with in the Romano-British and Neolithic horizons, a × indicating their presence. The list of the smaller vertebrate and molluscan remains of Pleistocene age is too lengthy for incorporation in the present report, and readers are referred to the *Lancashire Naturalist*, October-December, 1909; February, 1910; and March, 1912. The small vertebrates are represented by about twenty-five forms, including two lemmings and two voles, which are extinct in this country; the mollusca are represented by at least fifty species, of which one is extinct in the British Isles, and others not now existing in the immediate district of the cave.